

Auctions of Stranded Assets

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After years of anticipation, deregulation of the power supply side of the electricity industry is now near. After deregulation, the market values of generation plants will likely differ substantially from the book values on which investors' allowed returns were based. Some portion of the differences may be paid off by universal service charges imposed on power consumers. These charges will receive intense scrutiny from legislatures, regulators and consumers.

A central issue is how to establish the current values of generation facilities, as well as long-term supply contracts and other entitlements to shares of power output from jointly owned facilities. The possibilities range from actual valuation in a market, at one extreme, to negotiated agreement on estimated values at the other extreme. These possibilities differ further in the fact that an actual market reflects the values obtained from reallocating ownership, whereas negotiation relies on estimates of prices in subsequent resale markets. Legislatures and/or regulators will be concerned also to influence the competitive structure of the industry. A market process can be designed to encourage efficient organization of the industry, and in particular to avoid concentrations of monopoly power, whereas reliance on resale markets dilutes this opportunity to affect the industry structure.

The purpose of this essay is to describe one possible market design that uses auctions. In subsequent sections I outline the ingredients an auction format requires, and sketch its advantages and risks. I focus on valuing and allocating generation assets; transmission assets and distribution franchises are not considered here.

Auctions are popular candidates because all concerned parties are familiar with the main features, and are aware that auctions have been used successfully elsewhere in privatizing public assets -- and of course auctions have been used in private markets for millennia.¹¹ Most important,

Among the federal agencies using auctions recently are the Environmental Protection Agency (sale of emission allowances), the Federal Communications Commission (spectrum licenses), the Department of Interior (mineral exploration leases and timber rights), the Resolution Trust Corporation (assets from Savings and Loan institutions), and the Treasury (government bonds). The FCC spectrum auctions have brought approximately \$20 billion to the Treasury over the past two years.

auctions are transparent: they conform to established rules known to both participants and observers; and, the process is easily monitored and the results are immediately understood.

Absent evidence of collusive behavior by bidders, the results of an auction are widely accepted as equitable and efficient, and the prices reflect the maximum revenue obtainable. In fact, auctions are not quite so ideal a market mechanism, because the rules can be designed to influence the slight tradeoff between revenue and efficiency; and, it is certain that bidders' strategies will exploit whatever opportunities for profit the rules allow. For these reasons, auctions must be designed to achieve the objectives of public policy, and the rules and procedures must be constructed carefully to close every loophole and to ensure smooth operation.

A further important factor is that auctions are quick and certain compared to negotiations.²² Deregulation of the industry requires a date certain at which the old regime ceases. A general auction of all assets in a state, or a sequence of auctions, can meet such a deadline, whereas a series of negotiations over the valuations of many facilities can be protracted and its conclusion delayed further by holdouts or litigation.

Inherent in an auction, however, is the possibility of a substantial reallocation of ownership compared to the current regime. This will not be disruptive if an ample transition period is allowed for transfer of ownership and operations, including new patterns of power supply contracts. It is important, moreover, to realize that a similar, albeit slower, reallocation of ownership via secondary resale markets would occur after deregulation even if asset values were negotiated with existing utility companies. This is subject to the proviso that deregulation accomplishes its objective of reversing the previous vertical and substantial horizontal integration of the power industry. (It is true that after negotiated pricing of assets there might not be many resales if the generation divisions of the utilities were able thereby to retain and exploit substantial monopoly power, but this would reflect mainly the failure of deregulation to produce a competitive industry.) I construe the prospect that an auction might produce a reallocation of ownership as a principle advantage: it resolves quickly the uncertainty that would otherwise prevail as to whether and how the utilities will accomplish the divestitures envisioned in the deregulation plan. The utilities' interests on this matter are naturally divided. For those utilities

For regulators and sellers, auctions are also inexpensive. Against this must be counted the costs incurred by bidders, although for utilities bidding on their own facilities it remains true that an auction incurs less costly preparation than a negotiation with the state. Auctions are also relatively immune to risks of subsequent litigation.

intending to specialize in distribution, an auction of generation assets is likely to obtain the best prices at the lowest cost; even so, this foregoes the 'option value' of deferring divestiture, as well as the incentives the state might allow. Those intending to remain active on the supply side might gain by excluding competition from the valuation process.

In choosing an auction, therefore, the legislature and/or regulator would be opting for three advantages. One is that the magnitude of any stranded investments would be determined by genuine market processes, uniformly applied, rather than by possibly inaccurate value estimates offered by the incumbent utilities in negotiations. Besides being inherently self-serving, the credibility of a utility's value estimate is jeopardized by the substantially inferior information available to the state agency charged with negotiating a price. At the very least, the transparency of an auction, and its uniform treatment of all parties, reduces the likelihood that deregulation is delayed by litigation initiated by consumer groups or utilities. And, it obviates the recriminations that might otherwise ensue if asset values were to rise appreciably in the years following negotiated valuations. The second is that an auction captures at the outset that portion of the value of assets that would otherwise be captured by utility investors via asset sales in secondary markets. It also saves the incentive payments that might otherwise be necessary to encourage utilities to divest themselves of generation plants in order to promote a competitive power market. The third is that the auction itself would allow and encourage division of the utilities' generation plants among a sufficient number of competing firms to initiate a competitive market for power supplies. This is subject of course to the proviso that the auction design precludes or discourages dominant accumulations of generating assets.

Against these advantages must be counted the seeming boldness of a major auction of generating facilities and entitlements. In the short term it is simpler to manage a smooth transition by simply turning ownership of the generating plants over to the utilities on the basis of negotiated prices. The central issues of whether the state can extract prices in negotiation that reflect full market values without protracted litigation or invasive legislation, and whether a negotiated transition can produce an efficient and competitive industry, are outside the scope of this essay. Here, I focus on how an auction process would work.

Objectives of the Legislature and/or Regulator

Consumers' long-term interests are served by an efficiently organized competitive industry. Efficient organization provides low costs and competition ensures comparably low prices. The rapid progress towards deregulation stems from the widely accepted view that the technology of

power production can now sustain a competitive industry. If concentrations of monopoly power are avoided, deregulation will allow vigorous competition and lower prices for consumers. In the longer term, efficient organization and investments in the industry will be ensured by active markets, both for power flows and for resale of production facilities. This prospect encourages the view that auction designs will likely focus on the shorter-term objective of minimizing the amount of any charges to pay for the costs of stranded assets. That is, the objective is to ensure that the prices obtained in the auctions are the full market values of the assets. Here, the market values represent the expected present values of the best alternative allocation of ownership and operation. Hidden in this statement of the objective, however, are many details that I address below. For now, the key point is that the availability of resale markets to correct inefficiencies in the initial allocation of ownership, indicates that the dominant consideration is revenue maximization. This accords with the political pressures to minimize any stranded cost charges, but it puts the burden on the bidders to develop efficient long-term plans for utilization of the facilities they acquire. The most important implication is that the auction should be conducted only after the terms of deregulation are sufficiently precise and firm that bidders can anticipate accurately the competitive environment in which they will operate.

Nevertheless, there will be pressures in some states to allow multi-attribute bids. These schemes typically give preferential credits to bidders who commit to various social objectives, such as pollution abatement, use of locally extracted fuels, demand-side energy conservation, disposal of nuclear waste, or development of alternative energy sources such as wind, solar, or biomass. These pressures encounter two practical problems. One is that examples of well-executed multi-attribute auctions are rare. The other is that such schemes conflict with the incentives of utility investors to obtain the maximum price, since subsequent recovery from the universal service charge is unlikely to cover the entire difference. Unless the state commits to reimbursing each utility for the credits allowed the winning bidders for its properties, such schemes seem unworkable in the context of sales of stranded assets. There is also, of course, the inherent ambiguity about deregulation that these schemes imply: to the extent that the state is removing itself from regulating the supply side of the power industry, residual intrusion into the management process is best left to the state's other agencies for environment controls and the like.

The secondary objectives of the auction design focus on the details of implementation. The basic requirement is: no screw-ups --- the auction rules and procedures must be airtight. They must be tightly constructed to close loopholes that might be exploited by bidders, and the procedures

must ensure speedy, low-cost, problem-free execution. They must be sufficiently simple to be well-understood by bidders, as well as their investors or financiers, and ensure a level playing field for all. Overall, the process must preserve the transparency that is the hallmark of auctions, and that is the source of bidders' and consumers' confidence in the outcome. Much of the discussion below elaborates these important details.

The Items Offered

An inherent limitation of an auction is that the items for sale must be completely specified in advance. This might not be a major impediment when the item consists of a previously existing entitlement contract, or it consists of a free-standing generation facility sold in its entirety. More likely, however, the states will impose obligations on the buyer. An auction requires that these encumbrances, whether explicit or implicit, are delineated in the general provisions for deregulation, or in the purchase contract that constitutes the item offered for sale. Even if the ultimate buyer is the same as the seller, it is essential that the terms of sale are sufficiently precise that other bidders can participate without fear of risks hidden in incomplete or ambiguous terms.³ This is especially important in attracting financing from outside the power industry.

Among the general provisions of deregulation, several are likely to be especially important. One comprises regulatory powers retained by state agencies, such as environmental controls and requirements for pollution abatement. Another comprises obligations for participation in industry management: pricing of power in a daily market, conformity to the regional power pool or ISO's dispatching protocols, transmission allocation and interface requirements, unitized operation of hydro basins, etc. Others comprise service obligations for unassigned customers, fixed dates for transfer of ownership, and reporting requirements to state agencies. One can also imagine that states will designate themselves as residual owners or operators of last resort in case of operational disruption, default, or bankruptcy. At this point it is unclear whether states might allow sellers to bundle further obligations with the facility or entitlement, such as a short-term obligation to provide power to a distribution company until new supply contracts are concluded.

A consideration addressed below is whether a collection of facilities or entitlements can be

I use the term 'seller' to denote the current owner of a facility or entitlement. In reality, the seller in an auction of stranded assets is the state, since the main revenue effect of the sale is to reduce the universal service charge imposed on consumers.

offered as a single block, or must a bidder acquire the collection piece-by-piece. This indicates a need for standards to guide the definition of parcels offered for sale, as well as any related requirements for integrated operation of a group of tightly interrelated plants or dams. There may be cases in which a small utility choosing to specialize subsequently in distribution believes that its generation assets will command the highest price when sold as a group to, for example, one of the major regional utilities. To avoid litigation on such matters, it is important to set general standards applied uniformly; and, to use an auction design that allows such a major utility ample opportunities to bid for aggregations of facilities for which it perceives complementarities among the components (if these advantages are sufficiently large then its bids will win).

Structuring the Sale Process

If the auction format is not otherwise structured, it is likely that each utility will conduct a sale of its own assets. This presents several problems, and most importantly, it foregoes opportunities to encourage higher prices in the auctions.

Some of the problems are administrative. Uniformity of procedures and rules is difficult when different utilities conduct their own auctions. Ensuring conclusion of all the auctions before the prescribed date for deregulation is complicated when multiple independent auctions are allowed. For bidders, there can be substantial economies in obtaining financing and in preparing bidding strategies when all the properties are offered in a single auction. Based on recent experience with auctions by federal agencies, the size of an auction is not a significant constraint, and in many ways size is a distinct advantage in attracting bidders and investment capital. Capital markets can absorb ten billions of dollars in auction financing without a ripple. For the administrative agency charged with responsibility for an auction, a single auction is likewise no impediment; e.g., there are now available quite sophisticated software packages for auction administration that can handle almost any number of items and bidders.

Quite separate from the administrative problems of multiple auctions is the deeper problem that some utilities will want to bid on their own plants and entitlements. Doing so in an auction solely of their own properties, in which they will likely have substantial influence on the design and administrative process, as well as inherently superior information, is simply too close to conflict of interest --- it could jeopardize consumers' faith in the integrity of the price determination process. If bidding for currently owned properties is to be allowed, then it seems essential to pool the properties in a larger auction that is centrally administered. In a large

multi-round auction, the public's ability to watch the competitive process at work mutes fears of inside dealing and builds confidence that the outcome reflects genuine market prices.

A single auction of all the electric generation assets in the state is also likely to enhance the revenue obtained. One reason is that the scale economies attract more bidders and better financing, and the variety of properties enable each bidder to shop for bargains from its perspective. In a multi-round auction, shopping means using various backup strategies depending on the evolving pattern on prices. Especially for a bidder trying to assemble a particular amount and balance of base and peaking capacity, or a regional complex, or a particular configuration of fuels or nearby industrial customers, the wider variety of properties offered in a single auction provides the best opportunity to optimize the bundle of properties bid for to the prices that must be paid to acquire them.

Another reason for the advantage of a single multi-round auction is informational. Each bidder's estimate of the value of a property is necessarily imperfect. Part of the value may reflect advantages unique to that bidder alone, but the larger part is common to all bidders. It depends on factors such as technological developments, fuel prices, the evolving proportions of base and peak demands, and overall demand growth that affect all bidders. Each bidder therefore uses the developing pattern of prices as the auction progresses as summary information about the estimates of these factors assessed by other bidders. This learning process protects bidders against the so-called winner's curse that might otherwise be a hazard.⁴

On the other hand, there can be persuasive reasons for segregating some items into separate auctions. The most obvious candidates are hydro facilities. In particular, if forced unitization of operations within a drainage basin is unworkable, then the basin's entire complex might be offered as a single item in a separate auction. Similarly, the magnitude of a nuclear facility and the stringent requirements for an operating license might argue for a separate auction.⁵

Disclosure by Sellers

In a single-item sealed-tender auction, the winner's curse refers to the risk that the winning bidder is the one who has most over-estimated the value. This risk is diminished in multi-item auctions and in multi-round auctions.

The FCC spectrum auctions divided the properties by type and size: narrow- versus broad-band, national versus regional versus local licenses, etc.

In bidding for a generation plant, buyers are exposed to significant operating risks to whatever extent the seller's disclosures are incomplete. These risks discourage participation or raise the cost of bidders' financing. The problem is complicated further by the prospect that in some cases the seller will also participate as a bidder (or participate implicitly by offering a reserve price), and might therefore gain by providing inadequate or even misleading information. This prospect indicates that it is essential that the state impose stringent disclosure obligations on the seller, and possibly also penalties and/or residual liability for hiding or distorting information.

Standards for disclosure of equipment specifications and historical operating and accounting data appear straightforward. Similarly, I expect that disclosure of existing contractual relationships with labor unions, fuel suppliers, and the like impose no impediments. More problematic is how to specify workable requirements for a seller to provide a reasonable foundation on which bidders can develop reliable forecasts of future operating performance. One possibility is to require provision of a simulation model of operations that allows bidders to project future operating performance with an accuracy that reasonably approximates the seller's forecasting ability.⁶ If the seller is participating as an active bidder, monitoring and enforcement of these requirements will be especially important. If enforcement is too onerous then it may be necessary to impose limits on the seller's participation in the bidding, such as limiting it to a (possibly secret) reserve price. I assume that seller participation in the bidding cannot (and on efficiency grounds, should not) be prohibited, since it is unlikely that the state can exclude a seller from joining an alliance with another bidder.

Allowing a seller to participate as a bidder creates a fundamental conflict of interest between the seller and the state. If the seller loses then it prefers to obtain the maximum price from another bidder, on the presumption that ultimately it will recover less than the full difference between the book value and the sale price. If it wins, however, it prefers to do so at the lowest possible price. Thus, the state's interest in the highest price can conflict with the seller's interest.

The other enforcement task is to prevent collusion among bidders, or between the seller and other bidders. Each state has its own antitrust laws, and federal laws are applicable as well; moreover, these statutes and sanctions are well-tested in a long history of precedents regarding collusion in

If the model itself is proprietary then the state might require disclosure of the results of simulations run for a standard set of scenarios of future developments in the regional power industry.

auctions and other conspiracies to affect prices.⁷ The severity of the criminal and civil penalties (including tripling of damages, which encourages potential plaintiffs to identify misdeeds) indicates that these statutory provisions are ample. Some federal auctions, however, have imposed further penalties, such as exclusion from eligibility for operating licenses.

Ground Rules

Disclosure requirements are just one of several basic ground rules that must be established. In this section I sketch some others that set the stage for an auction. A basic requirement for an auction is that the rules and procedures are fixed in advance, and apply equally to all participants. This imposes on the state the task of constructing a set of rules, and specifying them in language that is both straightforward and adequate legally. This is not a trivial task the first time, but if several states use auctions for stranded assets then the specifications will become standardized (the various federal auctions exemplify this evolution towards standardization).⁸ For the legislature and/or regulator, a first step is to delegate the design authority to a cognizant state agency, or to create a special agency to conduct the auctions. This delegation should include a statement of objectives and a time frame: the congressional mandate for the FCC spectrum auctions provides an example.

A second basic requirement is a firm time frame of adequate length. Unlike a series of negotiations, an auction requires the coordinated participation of many bidders simultaneously. Moreover, each bidder needs ample time to develop operating projections and value estimates; some then need further time to use these projections to solicit investors or loans, or to build a consortium. In addition, investment banking firms are likely to develop innovative financing vehicles for established plant operators, and to establish corporate entities (with subcontracting of operations) as additional bidders whose shares can then be resold to a wider range of funds and individual investors. A time frame that is too short or ambiguous is bound to curtail participation or limit prices via inadequate financing. Six months is required, provided the terms of deregulation are clarified earlier.

I presume that these laws apply as well to the use of 'shills' to elevate prices. A seller who is not bidding for its own properties could encourage others to drive up the price in order to increase its revenue.

An especially fine codification of auction rules and procedures is the FCC's 2nd Report and Order, as well as the Manuals for Bidders issued for auctions \#4 and \#5 of broadband spectrum licenses.

The aforementioned possibility of bidding by corporate entities without operating experience hints at the larger problem of specifying the qualifications required for eligibility. Participation will be greater the more allowance is provided for entities to bid as owner/investors, anticipating subcontracting of operations to others qualified to obtain operating licenses. Proof of adequate financial resources may be required. The state may also impose limitations on shares of the power market that can be acquired, restrict interlocking patterns of ownership, and limit ownership in certain categories such as non-U.S. corporations.

Ensuring beforehand that eligible participants meet standards of financial responsibility is the first of a series of measures to maintain the viability of the auction. More generally, to ensure that bids are 'serious', the auction agency must establish enforceable penalties for withdrawal of a bid, or default on payment. At a minimum, these penalties include forfeiture of a substantial initial deposit or security bond. These measures assure a serious participant that competing bids are not phantoms that drive up the price it must pay. The penalties should reflect the real costs of delay and administration incurred by the state and the seller in re-offering the property in a subsequent auction, or via a negotiated transaction.

The risk of default is aggravated if the state (or the seller) allows delayed or staged payment of the sale price. The state has basically two alternatives. In one the state mandates an immediate down payment and quick completion of the transaction, subject to the penalties for default. For bidders, this means essentially that financing commitments must be established in advance. Although this might hinder some smaller bidders, it is unlikely to affect major bidders. The alternative is for the state to assign the risk and responsibility to the seller. In this case, if it is not intending to bid for its own facilities, then it might want to enhance the price by allowing delayed payments that attract smaller bidders with limited access to capital markets. The typical seller in this circumstance is a utility that intends to specialize in distribution, and is mainly interested in maximizing the total of the sale price and its subsequent recovery from the universal service charge.

If bids are submitted electronically then one needs a procedure to verify the identity of the bidder and confirming the item bid for and the amount offered. Similarly, a dynamic auction requires a procedure for timely reporting of the results of each round to the bidders. To establish conformity with the auction rules and procedures, and to protect against litigation, the entire process should be monitored by an independent auditing firm that certifies the final results.

To give a flavor of more mundane ground rules, I mention the design of failure modes. A well-designed auction should specify how a wide variety of contingencies or interruptions will be handled, and assign authority to an administrator or agency to cope flexibly with unexpected developments. These range from computer system failures to gyrations in financial or fuel markets. At a minimum this authority should enable the auction to be temporarily suspended, or if necessary, canceled and rescheduled. One must also specify provisions for re-offering a property, perhaps in a subsequent auction, on which the winning bidder defaulted or withdrew. If a property did not sell, because it did not receive a bid exceeding a reserve price, then presumably the utility that set the reserve price is the residual claimant at the reserve price. It is likely, however, that the state will mandate minimum reserve prices (e.g., on a cents/kilowatt of capacity basis), below which it is not prepared to reimburse any portion of the remaining cost of stranded assets from a universal service charge. In this case it might be necessary for the state to accept temporary ownership as the residual claimant.

Auction Rules and Procedures

In this section I describe, first, some basic factors that motivate an auction design; second, an outline of how one such auction would work; and third, variations on this outline that indicate the design parameters that a state agency can use to affect the pace and likely outcome of an auction of stranded asset

Basic Considerations in Auction Design

The role of an auction is to enable the equal participation of all potential buyers, to elicit commitments about their willingness to pay, and to allocate the items to those valuing the items most --- thereby obtaining prices that represent the estimated values of the best alternative allocation. The motivation for such a market process lies in the need to elicit commitments that reflect value estimates that are known privately by each bidder. Negotiation is like a single-bidder auction in which the state is forced to take an active role against the essential monopoly power of the incumbent utility. In contrast, in an auction the pressure of competition from other bidders forces each bidder to reveal how highly it values the items. In addition, a dynamic auction with multiple rounds has the two further advantages that bidders can improve their value estimates by drawing inferences from others' bids; and near the close of the auction, each bidder can optimize the package of items it acquires in response to what are by then essentially firm market prices.

The three tasks of auction design are to ensure smoothly functioning procedures, to close loopholes that might enable bidders to 'game the system,' and to ensure that bids are serious -- that is, they represent genuine commitments that other bidders must beat to win. Several auction designs have met the test of experience. Nowadays, smooth procedures are obtained primarily by using software systems that enable secure submission of bids electronically and reporting of results. Rules that minimize the possible effects of strategic behavior are exemplified by some of the federal auctions, most notably the several FCC auctions of spectrum licenses in 1994-96. Serious bidding is typically ensured by two devices. One is forfeiture of deposits and other penalties for withdrawing or defaulting. The other, used in the FCC auctions and some private commercial auctions, is an 'activity rule' that requires bidders to keep up with the steadily increasing prices or else forfeit some proportion of their eligibility for continued participation; that is, losing eligibility restricts the set of properties on which they can bid. An activity rule is an example of a rule designed to ensure that prices reflect bidders' actual willingness to pay. It does this by limiting the subsequent opportunities of those bidders who fail to demonstrate a willingness to offer bids that beat the current high bids.

Additional design features are motivated mainly by practical considerations. For instance, the rate at which bids must rise each round (the so-called bid increment) is selected to ensure a timely close of the auction. The choice of a format with multiple rounds of sealed bids is dictated in part by the complexity of implementing continual bidding, but more important, it provides bidders with sufficient time to adjust their bidding strategies and to confer with corporate officers or investors; indeed, the stately pace of a multi-round auction is preferred by bidders to the frenzy of an open-outcry auction. Typically the closing rule specifies that bidding for all properties concludes simultaneously. This ensures that all bidders have essentially equal opportunities to acquire properties at the nearly-final prices near the close; and, it enables bidders to adopt backup strategies as they see the prices of their initially preferred properties rise beyond what they are willing to pay.

An Example

To illustrate, I outline how a multi-round auction for stranded assets would work. Those familiar with the FCC spectrum auctions will recognize that this outline parallels them closely --- indeed, it is likely that imitating the spectrum auctions will nearly suffice for stranded-asset auctions. In a typical state-wide auction of fossil-fuel plants and entitlements, there are several dozen properties offered for sale. Each property is accompanied by a reserve price that is the larger of

the reserve prices specified by the seller and the state. For each property, the seller's disclosures and copies of the legal sale contract have been distributed in advance to qualifying bidders. Also provided are written statements of the auction rules and procedures. In response to this information, each bidder provides in advance a deposit or bond in proportion to the kW of generating capacity on which it wants to bid (this is its initial eligibility), and receives a password and software kit that enables it to submit bids remotely.

During the auction there are initially two rounds daily, each open for bid submission during two hours. In each round each submitted bid, to be acceptable, must be as high as the property's reserve price and as high as any previous high bid plus a stated increment (e.g., 5 percent). According to the activity rule, a bidder's eligibility for subsequent rounds is reduced proportionately if it does not meet the bid increment (and did not submit the previous round's high bid) on properties whose capacities accumulate to a required fraction of its eligibility. (The rules may also allow bid withdrawals and limited waivers from the activity rule.) At the end of each round the auction administrator reports for each property the high bid and, using the bid increment, the minimum bid required next round (in the FCC auctions all bids are reported, along with the identities of bidders who offered them). The auction closes when no property receives a new bid as high as the required minimum bid. The properties are then sold to the bidders submitting the standing high bids. Down payments are due immediately after the auction closes, and the remainder are due a few weeks later.

Design Parameters

The outline above includes the main features of the spectrum auctions. In passing, it mentions several of the parameters that can be used to control participation and the pace of the auction: reserve prices set by the incumbent owner and the state, the deposits required from bidders, the number of rounds per day, the bid increment each round, each bidder's required activity each round as a fraction its current eligibility, provisions for waivers and withdrawals, and the closing rule. Also relevant is the amount of detail in the information reported to bidders: minimal detail provides a further safeguard against collusion, but bidders prefer to know whom they are bidding against.

Other auction formats differ significantly from this outline. For example, one can allow submission of a single bid for a group of properties, with the understanding that it wins unless the sum of the high bids for the component properties exceed it. At the other extreme, instead of a

simultaneous auction of many properties, they might be auctioned in sequence (this eliminates the advantages of the multi-round format mentioned above). A single round of sealed tenders may suffice in isolated cases, such as a single small plant or entitlement.⁹

Some Risks of Using Auctions

The preceding sections emphasize that an auction is quick and effective in establishing market prices. It also has risks, and some of these are described here --- though in large part they are risks that affect any market process. I presume in any case that the auction is professionally designed to ensure airtight rules and problem-free procedures.¹⁰

A significant risk in any auction is that the number of bidders is insufficient to ensure vigorous price competition. In the case of stranded assets, the likely remedy has two ingredients -- in addition to the obvious advertising and marketing tactics. The first ingredient is elimination of regulatory uncertainties, which otherwise would surely dampen demand for properties and seriously impede financing arrangements. This may require active cooperation by state agencies with investment banks and other financiers to clarify the terms of deregulation. For instance, in addition to requirements imposed on asset owners and facility operators, bidders and their investors will want detailed predictions about universal service obligations, the operation of the daily power exchange market, unit dispatching and transmission scheduling and investment by an independent system operator, and the time frame and milestones for transition to a fully competitive market. The second ingredient is early publication of the auction rules and an ample duration in which to prepare value estimates, obtain financing, and develop bidding strategies. A second risk is that demand from non-utility bidders will be suppressed by the informational advantages of the incumbent utilities. If deregulation is to succeed in creating a disintegrated competitive industry, this informational barrier to wider participation must be overcome eventually. It is better to address the problem directly in the initial auction than to have it remain

In the theory of auctions, there are well-studied auction designs that are supposed to produce an efficient allocation of the properties. However, they need not maximize the revenue obtained and some are quite complex to administer. For auctions of stranded assets it is clear that the revenue objective and the requirements for procedural simplicity exclude these exotic auction designs

One must assume that bidders will exploit even the smallest loophole in the rules. Ample legal language is no protection; rather, the rules must fit together like the pieces of a puzzle. In the power industry, the notorious example is the 1993 power-supply auction in California, which was ultimately vacated by the Federal Energy Regulatory Commission.

as a source of continuing monopoly power later. The principle remedy therefore lies in the disclosure requirements. Mandated requirements for ample disclosure are the surest way to protect potential buyers against the hazards of bidding against an incumbent with superior information.

A third risk is that a substantial reallocation of ownership resulting from an auction might interfere with a smooth transition to a deregulated regime, or that it might eliminate economies of scale and scope that depend on vertical integration, or otherwise impair the tight coordination of the power system. The remedy for short-term transitional problems is to mandate a transition period of sufficient duration to allow conclusion of the contractual aspects of the transaction, transfer of operating authority, and transfer or negotiation of any new contracts for personnel, fuel, or power sales. It is because there may be significant scale economies or complementarities that some utilities will enter the auction as bidders for their current properties. A short-run complementarity arises because of locational advantages in relation to the existing transmission grid. In the long run, the main complementarity is the greater reliability of power supply from a producer with several generating plants. If these economic advantages are large then the integrated utilities will be stronger bidders for their properties and will likely succeed in retrieving them.

A fourth risk is that preparations for an auction might collapse in a mass of detail. Because professional auction design and auctioneering services are available, as well as complete software installations, I doubt that this would be the problem. Similarly, deciding on the details of the plan for deregulation is necessary whether an auction or negotiation is used. The risk therefore resides primarily in the task of defining the properties and preparing the legal language of the sale contracts that are the actual items offered at auction. Any payments of any portion of the cost of stranded investments via a universal service charge will in any case require precise definition of the properties, and usually the state's regulatory agency already possesses substantial documentation about each plant and entitlement. The difficulty, therefore, resides primarily in the formulation of sale contracts. For an entitlement this contract is simply a transfer of what is already a well-defined contract. For a generation plant the preferred remedy is a state mandate that the land and physical plant is sold in its entirety, but stripped of the entangling web of the utility's existing contracts for personnel, fuels, and sales. This simplifies the lawyers' task in writing sale contracts, but it leaves with the winning bidder the follow-up task of negotiating the new contracts necessary for continuing operations. Nothing so simple is possible for nuclear plants, presumably; and hydro facilities may be hostage to federal requirements for re-issuance of

use permits for dams and waterways.

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The following articles about the FCC spectrum auctions include descriptions of the design and performance of these auctions that are indicative of the features that will be relevant in auctions of generation assets.

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